SUM IT UP: Differential Equations 1 (non-calculator)

Consider the differential equation $\frac{dy}{dx} = -\frac{2x}{y}$

1. What is the slope of y at the point $(1, 2)$?

1. _____

2. Let $y = f(x)$ be the particular solution to the differential equation with the initial condition $f(1) = -1$. Write an equation of the tangent line to the graph of f at $(1, -1)$ and use it to approximate $f(1.1)$.

2. _____

3. Find the particular solution $y = f(x)$ to the given differential equation with the initial condition $f(1) = -1$. What is the value of the constant underneath the radical?

3. _____

4. What is the slope of y at the point $(-1, 1)$?

4. _____

Sum: _____

SUM IT UP: Differential Equations 2 (non-calculator)

Consider the differential equation $\frac{dy}{dx} = \frac{-xy^2}{2}$. Let $y = f(x)$ be the particular solution to this differential equation with the initial condition $f(-1) = 2$.

1. What is the slope of y at $(-1,2)$?

1. _____

2. What is the slope of y at $(2, 1)$?

2. _____

3. Write the equation of the local linear approximation of f at $x = -1$. What is the y-intercept?

3. _____

4. Find the solution $y = f(x)$ to the given differential equation with the initial condition $f(-1) = 2$. Write your answer as a simple fraction. What is the value of the numerator?

4. _____

Sum: _____

SUM IT UP: Differential Equations 3 (non-calculator)

Consider the differential equation $\frac{dy}{dx} = x^2(y-1)$.

1. What is the slope of y at the point $(0, 3)$?

1. _____

2. What is the slope of y at the point $(-1, 0)$?

2. _____

3. Write the equation of the local linear approximation of f at $(1, 3)$. What is the y-intercept?

3. _____

4. Find the particular solution $y = f(x)$ to the differential equation with the initial condition $f(0) = 3$. What is the coefficient of e?

4. _____

Sum: _____